

IN THE CLAIMS:

1-12. **(Canceled)**

13.-29. **(Canceled)**

30. (Currently Amended) A pressure regulator which comprises comprising a housing which includes an upper housing part and a lower housing part, said upper and lower housing parts defining an internal chamber therebetween, said lower housing part furthermore defining an inlet channel, an outlet channel and a valve channel therebetween, a flexible diaphragm mounted inside said housing for dividing said internal chamber into a variable volume upper chamber and a variable volume lower chamber, said flexible diaphragm biasing a movable valve element to open said valve channel when said upper chamber assumes its maximum size and said lower chamber assumes its minimum size, where the deflection capability of the flexible diaphragm is greater than a deflection necessary for acting upon the valve element, such surpassing deflection defining a compensating volume inside the housing, first biasing means for biasing said valve element so as to close said valve channel when said flexible diaphragm is deflected into the upper housing part, and second biasing means for biasing said flexible diaphragm into a position where said variable volume upper chamber assumes its maximum size, said lower housing part providing a bore which communicates said variable volume lower chamber with said outlet

channel flexible diaphragm moves downwardly to enlarge said upper chamber and shrink said lower chamber, and to close said valve channel when said flexible diaphragm moves upwardly to shrink said upper chamber and enlarge said lower chamber, first biasing means for biasing said valve element to close said valve channel when said flexible diaphragm moves upwardly and second biasing means for biasing said valve element to open said valve channel when said flexible diaphragm moves downwardly, and a bore in said lower housing part to connect said outlet channel with said lower chamber, such that a back flow of pressurized fluid medium into said outlet channel will flow through said bore into said lower chamber to move said flexible diaphragm upwardly to close said valve channel, said flexible diaphragm being upwardly flexible after the valve element closes the valve channel to provide a compensating volume for storage of back flowing pressurized fluid medium.

31. (Previously Presented) A pressure regulator according to claim 30, wherein said upper housing part defines an inlet bore for delivering compressed fluid medium into said variable volume upper chamber and an outlet bore for removing said fluid medium from said upper chamber.

32. (Previously Presented) A pressure regulator according to claim 31, wherein said second biasing means comprises compressed fluid medium in said upper chamber.

33. (Previously Presented) A pressure regulator according to claim 30, wherein said first biasing means is a compression spring.

34. (Previously Presented) A pressure regulator according to claim 31, including a safety valve in communication with said outlet channel.

35. (Previously Presented) A pressure regulator according to claim 34, wherein said safety valve includes a valve element and a third biasing means to bias the valve element in a closing direction.

36. (Previously Presented) A pressure regulator according to claim 35, including a supply line which connects the outlet bore of the upper housing part with the safety valve to help bias the valve element in a closing direction.

37. (Currently Amended) An apparatus for continuously measuring dynamic fluid consumption comprising a tank, a continuously-operating flow sensor for fluid, and a fluid pressure regulator between the fluid flow sensor and a fluid consumer, said pressure regulator comprising a housing which includes an upper housing part and a lower housing part, said upper and lower housing parts defining an internal chamber therebetween, said lower housing part furthermore defining an inlet channel, an outlet channel and a valve channel therebetween, a flexible diaphragm mounted inside said housing for dividing said internal chamber into a variable volume upper chamber and a variable volume lower chamber, said flexible diaphragm biasing a movable valve element to

~~open said valve channel when said upper chamber assumes its maximum size and said lower chamber assumes its minimum size, where the deflection capability of the flexible diaphragm is greater than a deflection necessary for acting upon the valve element, such surpassing deflection defining a compensating volume inside the housing, first biasing means for biasing said valve element so as to close said valve channel when said flexible diaphragm is deflected into the upper housing part, and second biasing means for biasing said flexible diaphragm into a position where said variable volume upper chamber assumes its maximum size, said lower housing part providing a bore which communicates said variable volume lower chamber with said outlet channel~~ flexible diaphragm moves downwardly to enlarge said upper chamber and shrink said lower chamber, and to close said valve channel when said flexible diaphragm moves upwardly to shrink said upper chamber and enlarge said lower chamber, first biasing means for biasing said valve element to close said valve channel when said flexible diaphragm moves upwardly and second biasing means for biasing said valve element to open said valve channel when said flexible diaphragm moves downwardly, and a bore in said lower housing part to connect said outlet channel with said lower chamber, such that a back flow of pressurized fluid medium into said outlet channel will flow through said bore into said lower chamber to move said flexible diaphragm upwardly to close said valve channel, said flexible diaphragm being upwardly flexible after the valve element closes the valve channel

to provide a compensating volume for storage of back flowing pressurized fluid medium.

38. (Previously Presented) An apparatus according to claim 37, including a conditioning system for the fluid.

39. (Previously Presented) An apparatus according to claim 37, including a pump for the fluid.

40. (Previously Presented) An apparatus according to claim 37, wherein the flow sensor is a Coriolis sensor.

41. (New) A pressure regulator according to claim 30, wherein said flexible diaphragm is concave.

42. (New) An apparatus according to claim 37, wherein said flexible diaphragm is concave.